

**What is claimed is:**

1. A fuel cell unit comprising:
  - a fuel cell for electric power generation;
  - a mixing tank housing a mixture of fuel and exhaust water
- 5 from the fuel cell;
  - a fuel tank housing the fuel;
  - a pump delivering the mixture and air to the fuel cell;
  - a casing housing the fuel cell, the pump and at least one of the fuel tank and the mixing tank; and
- 10 a partition partitioning an interior of the casing into a first compartment housing the fuel cell and a second compartment, the partition comprising first, second and third flow paths, the first flow path connecting the mixing tank to the fuel cell, the second flow path connecting the fuel cell to the pump, the third flow path connecting the pump to the mixing tank.
- 15 2. The fuel cell unit of claim 1, wherein:
  - the partition is configured to restrict heat transfer from the first compartment to the second compartment.
- 20 3. The fuel cell unit of claim 1, wherein:
  - the partition comprises a manifold including the first, second and third flow paths.
4. The fuel cell unit of claim 1, wherein:
  - the partition comprises one or more partition walls
- 25 having the flow paths disposed at one side thereof or therebetween.

5. The fuel cell unit of claim 1, wherein:  
the partition comprises an air inlet port.
6. A fuel cell unit comprising:  
a fuel cell for electric power generation;  
5 a mixing tank housing a mixture of fuel and exhaust from  
the fuel cell and connected to the fuel cell;  
a fuel tank housing the fuel and connected to the mixing  
tank;  
a pump connected to both the fuel cell and the mixing  
10 tank, the pump negatively pressurizing the fuel cell whereby  
delivery of the fuel to the mixing tank and delivery of the  
mixture and air to the fuel cell are done by the pump.
7. A fuel cell unit comprising:  
a fuel cell for electric power generation;  
15 a mixing tank housing a mixture of fuel and exhaust from  
the fuel cell;  
a fuel tank housing the fuel and comprising a porous  
body disposed along an interior wall of the fuel tank and a  
flow path connecting the porous body to the fuel cell; and  
20 a pump delivering the mixture and air to the fuel cell.
8. A fuel cell unit comprising:  
a fuel cell for electric power generation;  
a mixing tank housing a mixture of fuel and exhaust from  
the fuel cell and comprising a porous body disposed along an  
25 interior wall of the mixing tank, a cavity portion, an inflow  
path connecting the fuel cell to the cavity portion and an

exhaust flow path connecting the cavity portion to an outside of the mixing tank;

a fuel tank housing the fuel; and

a pump delivering the fuel to the fuel cell.

5 9. The fuel cell unit of claim 8, wherein:

the cavity portion comprises an obstruction piece configured to obstruct direct fluid transfer from the inflow path to the exhaust flow path.

10. The fuel cell unit of claim 5, further comprising:

10 a gas-liquid separation film disposed at the air inlet port.

11. The fuel cell unit of claim 5, further comprising:

a regulation valve disposed at the air inlet port.

12. The fuel cell unit of claim 10, further comprising:

15 a filter disposed at the air inlet port.

13. The fuel cell unit of claim 1, further comprising:

a fan driven by the pump so as to cool the mixing tank.

14. The fuel cell unit of claim 1, wherein:

the fuel cell comprises a direct methanol fuel cell.

20 15. The fuel cell unit of claim 1, wherein:

the fuel comprises methanol.